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(54) Titre : PROCEDE DE FABRICATION D'ALIMENTS MOULES A PARTIR DE LEGUMES, DE VIANDE ET D'AUTRES  
ALIMENTS INDIVIDUELS  
(54) Title: METHOD FOR PRODUCING MOLDED FOOD ITEMS FROM INDIVIDUAL PIECES OF VEGETABLES, MEAT  
OR OTHER FOOD

(57) **Abrégé/Abstract:**

The invention relates to a method for producing ready-to-cook, molded food items from individual pieces of vegetables, including rice or potatoes, fruit, meat, poultry, game, fish or seafood, pasta, baked items or a combination of parts of or all of these ingredients. Known methods do not allow a cookable final product to be produced from the frozen food item. The method according to the invention comprises the following steps: combining the ingredients to give starting products from frozen individual pieces, continuous or clockwise introduction of the starting products into at least one mold cavity and molding the frozen starting products to give a ready-to-bake or ready-to-cook frozen final product by compacting the starting products present in the mold cavity in order to mold the ready-to-cook food items.



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Zur Erklärung der Zweibuchstaben-Codes und der anderen Ab-  
kürzungen wird auf die Erklärungen ("Guidance Notes on Co-  
des and Abbreviations") am Anfang jeder regulären Ausgabe der  
PCT-Gazette verwiesen.(54) Title: METHOD FOR PRODUCING MOLDED FOOD ITEMS FROM INDIVIDUAL PIECES OF VEGETABLES, MEAT  
OR OTHER FOOD(54) Bezeichnung: VERFAHREN ZUM HERSTELLEN VON GEFORMTEN LEBENSMITTELN AUS GEMÜSE-, FLEISCH-  
UND ANDEREN LEBENSMITTELEINZELSTÜCKEN(57) Abstract: The invention relates to a method for producing ready-to-cook, molded food items from individual pieces of veg-  
etables, including rice or potatoes, fruit, meat, poultry, game, fish or seafood, pasta, baked items or a combination of parts of or all  
of these ingredients. Known methods do not allow a cookable final product to be produced from the frozen food item. The method  
according to the invention comprises the following steps: combining the ingredients to give starting products from frozen individual  
pieces, continuous or clockwise introduction of the starting products into at least one mold cavity and molding the frozen starting  
products to give a ready-to-bake or ready-to-cook frozen final product by compacting the starting products present in the mold cavity  
in order to mold the ready-to-cook food items.(57) Zusammenfassung: Die Erfindung betrifft ein Verfahren zum Herstellen von zubereitungsfertigen, geformten Lebensmitteln  
aus Einzelstücken von Gemüse, einschließlich Reis oder Kartoffeln, Obst, Fleisch, Geflügel, Wild, Fisch bzw. Meeresfrüchten,  
Teigwaren, Gebäck oder einer Kombination von Teilen oder aller dieser Inhaltsstoffe. Die bekannten Verfahren erlauben es nicht,  
aus dem tiefgefrorenen Lebensmittel ein garfähiges Endprodukt herzustellen. Dies ändert die Erfindung durch ein Verfahren mit  
den Schritten: Zusammenstellen der Inhaltsstoffe zu Eingangsprodukten aus gefrorenen Einzelstücken, kontinuierliches oder getak-  
tetes Einbringen der Eingangsprodukte in wenigstens ein Formnest und Formen der gefrorenen Eingangsprodukte zu einem back-  
oder kochfertigen, gefrorenen Endprodukt durch Verpressen der in dem Formnest befindlichen Eingangsprodukte zum Formen der  
zubereitungsfertigen Lebensmittel.

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Description:

**Method for producing molded food items from individual pieces of vegetables, meat or other food**

The invention relates to a method for producing ready-to-prepare moulded food items from individual pieces of vegetables, including rice or potatoes, fruit, meat, poultry, game, fish or seafood, pasta, pastry or a combination of some or all of these ingredients.

It is known from fish, meat or poultry processing to process frozen pieces of the foodstuff in order to form a moulded end product. Such a method is described for example in WO 97/10717. In said document, pieces of meat which are already in the subsequently desired shape are formed from a slab-type material under the effect of pressure.

It is known from EP 0 168 909 to produce a frozen block of vegetables or fruits via the shaping method. In this method, frozen products are processed in order to produce therefrom firstly blocks and subsequently individual portions of a foodstuff. The main use of this method is for example to produce portioned pieces of spinach, which can then be removed from the packaging on a portion-by-portion basis. After thawing these portion pieces, the product is then prepared in the conventional manner, wherein the bonding that took place during the freezing operation is dissolved as a result of the preparation process and the product breaks down into a ready-to-eat food item.

The disadvantage of this method is that the use is restricted to foodstuffs which break down into individual parts as a result of the preparation process after thawing of the intermediate product.

In addition to this method, other methods are known for producing potato products from mashed potatoes. For instance, US 4 276 314 discloses a method for producing so-called hash-brown potatoes, in which mashed potato products are



brought into the desired product shape prior to deep-freezing and then are frozen. After being thawed again, these products are then fried and prepared to make them ready to eat. This method is not suitable for producing products which are moulded only by the actual shaping process, but rather the method requires an additional external bond or a frying process which is able to quickly produce an outer shell of suitable strength in order thus to avoid disintegration of the product.

The object of the invention is thus to provide a method for producing ready-to-prepare or even ready-to-eat food items, by means of which not only meat but also vegetables can be moulded to form a cookable end product such that the meat, the vegetables or the combination thereof can be cooked in the frozen state without disintegrating or losing the essential shape, wherein a prior treatment of the end product, for example by coating with breadcrumbs or marinating, is not ruled out.

The invention provides a method for producing molded food items, the method comprising:

- combining a first preliminary product comprising first food item and a second preliminary product comprising second food item to form a single frozen starting product comprising frozen individual pieces, wherein said combining comprises:

- a) pre-compacting said first preliminary product in a premolding process so as to form a concave shape of said first preliminary product;
- b) placing said second preliminary product into a concave section of said first preliminary product that has a concave shape to form said single frozen starting product;

- introducing said single frozen starting product continuously or in batches into at least one mold cavity; and

- molding said single frozen starting product to form a ready-to-prepare frozen end product by compacting said single frozen starting product located in said at least one mold cavity so as to mold said ready-to-prepare food items.

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The invention also provides a method for producing molded food items, the method comprising:

- combining a first preliminary product comprising a first food item and a second preliminary product comprising a second food item to form a single frozen starting product comprising frozen individual pieces, wherein said combining comprises:

- a) pre-compacting said first preliminary product in a premolding process so as to form a concave shape of said first preliminary product;

- b) placing said second preliminary product into a concave section of said first preliminary product that has a concave shape to form said single frozen starting product;

- thawing said frozen individual pieces so as to produce a thawed single frozen starting product; and

- introducing said thawed single frozen starting product continuously or in batches into at least one mold cavity; and

- molding said thawed single frozen starting product to form a ready-to-prepare end product by compacting said thawed single frozen starting product located in said at least one mold cavity so as to mold said ready-to-prepare food items; and

- freezing said thawed individual pieces after said molding so as to generate a final single frozen starting product.

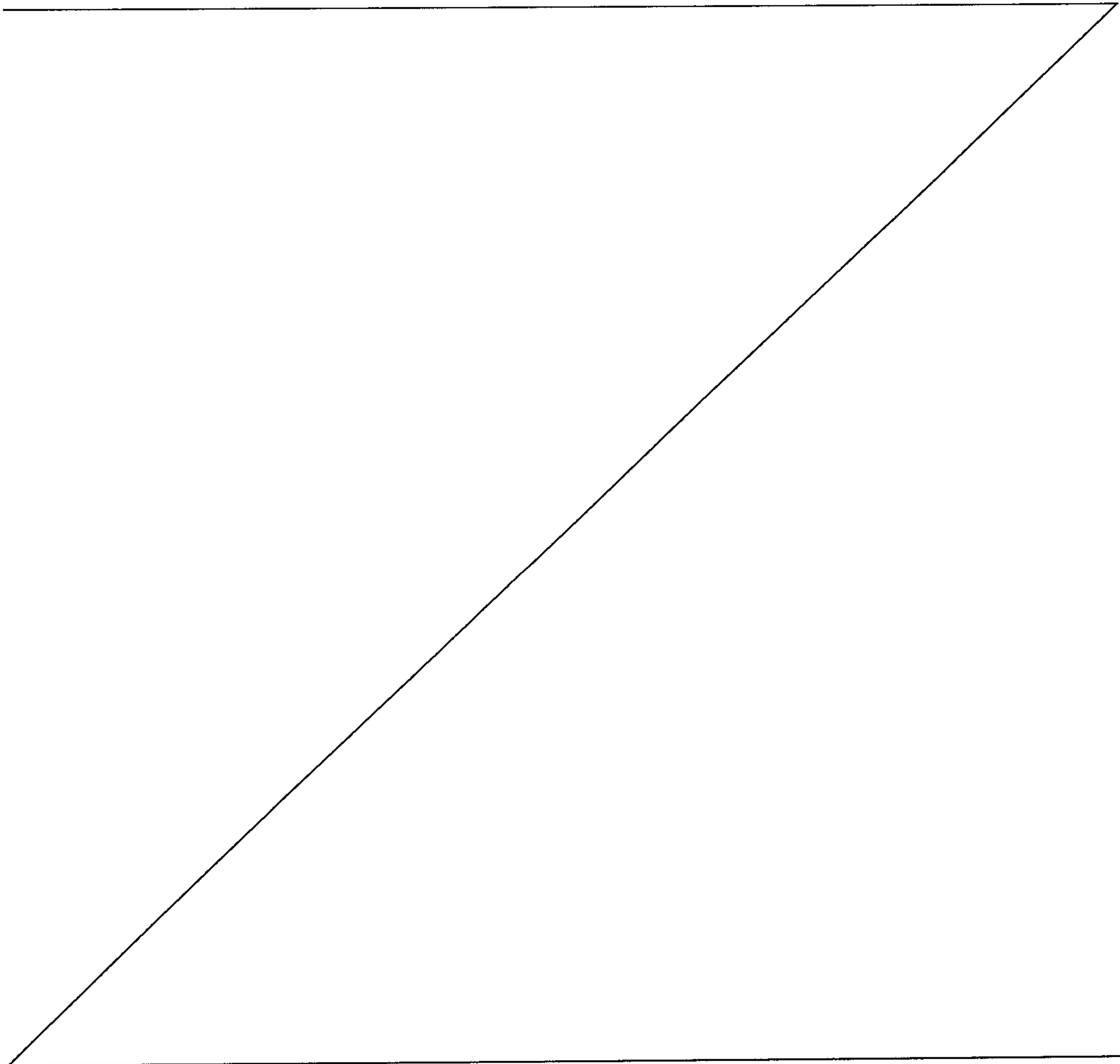
According to the invention, this object is achieved in that the method comprises the steps: combining the ingredients to form starting products consisting of frozen individual pieces, introducing the starting products continuously or in batches into at least one mould cavity and moulding the frozen starting products to form a ready-to-bake or ready-to-cook frozen end product by compacting the starting products located in the mould cavity so as to mould the ready-to-prepare food items.

One important novel feature of the invention is the fact that the frozen starting products can be processed to form a ready-to-bake or ready-to-cook frozen end product by being compressed in the frozen state in the mould cavity to form the desired shape. The products thus produced can then be cooked during a

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preparation process, for example in an oven or else in a frying pan, even without further treatment and while retaining the shape. It is also possible for the products to be produced in such a way that they are deliberately intended to disintegrate during the further preparation in order to give the impression of being prepared from foodstuffs processed in the natural or similar form.

One preferred use of the method according to the invention lies in the production of products consisting of frozen chips or sections thereof. To this end, relatively small pieces of potato are used as starting products and are placed in the deep-frozen state in a mould cavity which corresponds to the shape of a chip-like potato stick. The deep-frozen sections are then compacted, so that a deep-frozen potato stick is obtained as a ready-to-prepare food item. This can then be processed in the





conventional manner in an oven or in a deep-fat fryer. As a result, it is possible to process even products that are too small or too short, in order to produce approximately genuine chips from these previously unused leftover products.

The method according to the invention can be used to produce all types of food items from frozen individual pieces. The individual pieces used may be vegetables, fruit, meat, poultry, game or fish or other seafood. The individual pieces may also be a combination of some or all of these ingredients. In a first step, the required individual pieces are combined, which in particular entails sorting by size and weight.

The starting products of course need only be large enough for the desired end products to be produced therefrom. Although in principle the use of the invention in conjunction with mashed or ground products is possible, nevertheless one important field of use of the invention consists in using starting products which are smaller than the subsequent end products but which are still whole pieces of the original material. The starting products selected and frozen in this way are then moulded by being compacted in the mould cavity to form the end product, with the ingredients remaining frozen during the entire processing operation.

In the case of some products, it has been found that only by compacting the starting products at low temperatures do the products remain so firmly bonded to one another that disintegration during the subsequent preparation process, which of course entails thawing of the end products, can be avoided. However, the bonding of the individual pieces can be improved prior to freezing of the individual pieces or else prior to compaction and even thereafter by adding additional adhesion promoters. In the simplest case, this may be a liquid, in particular water or a protein-containing liquid, which improves the bonding of the individual pieces.

Before combining the starting products to form the frozen individual pieces, the products that are too large and also the products that are too small are removed. Products that are too large may either be fed to some other processing operation or else they may be subjected to a process for making them smaller so that they can again be fed to the actual method. Products that are too small are further processed in some other way in a conventional manner.

The adhesion force between the individual pieces can furthermore be increased if the individual pieces are thawed before being introduced into the mould cavities. As a result, during subsequent deep-freezing prior to the actual compaction operation, it is already possible to produce tacky bonds by freezing the individual parts to one another. It is also possible to spray the frozen or thawed starting products with additional water or other liquids.

Another particularly advantageous embodiment of the method according to the invention makes it possible to produce an assembly of several preliminary products to form a ready-to-eat end product. For example, a preliminary product of a first type can be produced from a mixture of individual pieces and either already pre-compacted in a pre-moulding process so that then, in a second step, a mixture of a second preliminary product produced in the same way can be compacted together with this first preliminary product or combined therewith in some other way. For instance, a bowl-shaped item made of rice may be produced as the first preliminary product while a sauce/vegetable mixture or a meat filling is used as the second preliminary product.

The first preliminary product may then have a concave shape, while the second preliminary product is placed in the bowl-like recess of the concave first preliminary product. Depending on the user's requirements, the first preliminary product may also be configured such that it disintegrates during the cooking process, so that the second preliminary product of stable shape then comes to lie in a bed of the disintegrated first preliminary product. In one example, the first preliminary product may for instance be the aforementioned rice edging, while the second preliminary product is then for example a mixture of vegetables and fruit. A meat product can also be arranged within a rice edging in this way.

Before being compacted in the mould cavity, the individual pieces may be provided with further additives. This may be for example a marinade or else a powder-type seasoning. In order to be able more easily to remove from the mould cavities the end products produced after compacting, it is possible to heat the mould cavities slightly so that the outer layer of the end product melts and thus prevents it from being frozen solid to the wall of the mould cavity.

In principle, the invention is characterised in that preferably mainly or entirely vegetable or fruit pieces are processed using the method. These pieces are deep-



frozen, sorted according to size and then compacted in the deep-frozen state either without or with the addition of further adhesion promoters or further flavour enhancers to form a ready-to-prepare end product of stable shape, whereby shape stability means that the food item produced in this way does not fall apart during the further processing, in particular during the thawing brought about by the heat of the preparation process.

**Claims**

1. A method for producing molded food items, the method comprising:
  - combining a first preliminary product comprising first food item and a second preliminary product comprising second food item to form a single frozen starting product comprising frozen individual pieces, wherein said combining comprises:
    - a) pre-compacting said first preliminary product in a premolding process so as to form a concave shape of said first preliminary product;
    - b) placing said second preliminary product into a concave section of said first preliminary product that has a concave shape to form said single frozen starting product;
  - introducing said single frozen starting product continuously or in batches into at least one mold cavity; and
  - molding said single frozen starting product to form a ready-to-prepare frozen end product by compacting said single frozen starting product located in said at least one mold cavity so as to mold said ready-to-prepare food items.
2. The method according to claim 1, further comprising adding a liquid to said frozen individual pieces before being introduced into said at least one mold cavity in order to improve bonding of said frozen individual pieces.
3. The method according to claim 2, wherein said liquid is water or a protein-containing liquid.
4. A method for producing molded food items, the method comprising:
  - combining a first preliminary product comprising a first food item and a second preliminary product comprising a second food item to form a single frozen starting product comprising frozen individual pieces, wherein said combining comprises:

- a) pre-compacting said first preliminary product in a premolding process so as to form a concave shape of said first preliminary product;
- b) placing said second preliminary product into a concave section of said first preliminary product that has a concave shape to form said single frozen starting product;
  - thawing said frozen individual pieces so as to produce a thawed single frozen starting product; and
  - introducing said thawed single frozen starting product continuously or in batches into at least one mold cavity; and
  - molding said thawed single frozen starting product to form a ready-to-prepare end product by compacting said thawed single frozen starting product located in said at least one mold cavity so as to mold said ready-to-prepare food items; and
  - freezing said thawed individual pieces after said molding so as to generate a final single frozen starting product.

5. The method according to claim 1 or 4, wherein said first food item comprises frozen individual pieces which have been made tacky by being sprinkled with a liquid.

6. The method according to claim 5, wherein said second food item comprises second frozen individual pieces which have been made tacky by being sprinkled with said liquid.

7. The method according to any one of claims 1 to 6, further comprising seasoning said frozen individual pieces before being compacted in said at least one mold cavity.

8. The method according to claim 7, wherein said seasoning comprises adding a marinade or a powder-type seasoning.



9. The method according to any one of claims 1 to 8, further comprising a demolding operation to remove said compacted frozen starting products from said at least one mold cavity.
10. The method according to claim 9, further comprises heating walls of said at least one molding cavity prior to said demolding operation in order to allow easier demolding of said compacted frozen starting products.
11. The method according to any one of claims 1 to 10, wherein said second food item comprises frozen individual pieces which have been made tacky by being sprinkled with a liquid.
12. The method according to any one of claims 1 to 11, wherein said first preliminary product is pre-shaped to include a bowl-like recess as said concave section while said second preliminary product is placed in said bowl-like recess.
13. The method according to any one of claims 1 to 12, further comprising feeding said ready-to-prepare frozen end product to a cooking process.
14. The method according to claim 13, wherein said cooking process results in said first preliminary product disintegrates so that said second preliminary product, which has a stable shape, lies in a bed of said disintegrated first preliminary product.
15. The method according to claim 13, wherein the cooking process is cooking using an oven or cooking using a deep-fat fryer.
16. The method according to claim 15, wherein said cooking process results in said first preliminary product disintegrates so that said second preliminary product, which has a stable shape, lies in a bed of said disintegrated first preliminary product.

17. The method of any one of claims 1 to 16, wherein said first food item comprises rice and said second food item is a meat filling, a meat product, a sauce/vegetable mixture, or a mixture of vegetables and fruits.
18. The method of claim 17, wherein said second food item is said sauce/vegetable mixture.
19. The method of claim 17, wherein said second food item is said meat filling.
20. The method according to claim 17, further comprising adding a liquid to said frozen individual pieces before being introduced into said at least one mold cavity in order to improve bonding of said frozen individual pieces.
21. The method according to claim 20, wherein said liquid is water or a protein-containing liquid.
22. The method according to claim 17, further comprising:  
thawing said frozen individual pieces before said introducing; and  
freezing said thawed individual pieces after said molding.
23. The method according to claim 17, wherein said first food item comprises frozen individual pieces which have been made tacky by being sprinkled with a liquid.
24. The method according to claim 23, wherein said second food item comprises second frozen individual pieces which have been made tacky by being sprinkled with said liquid.
25. The method according to claim 17, further comprising seasoning said frozen individual pieces before being compacted in said at least one mold cavity.
26. The method according to claim 25, wherein said seasoning comprises adding a marinade or a powder-type seasoning.

27. The method according to claim 17, further comprising a demolding operation to remove said compacted frozen starting products from said at least one mold cavity.

28. The method according to claim 27, further comprises heating walls of said at least one molding cavity prior to said demolding operation in order to allow easier demolding of said compacted frozen starting products.

29. The method according to claim 17, wherein said second food item comprises frozen individual pieces which have been made tacky by being sprinkled with a liquid.

30. The method according to claim 17, wherein said first preliminary product is pre-shaped to include a bowl-like recess as said concave section while said second preliminary product is placed in said bowl-like recess.

31. The method according to claim 17, further comprising feeding said ready-to-prepare frozen end product to a cooking process.

32. The method according to claim 31, wherein said cooking process results in said first preliminary product disintegrates so that said second preliminary product, which has a stable shape, lies in a bed of said disintegrated first preliminary product.

33. The method according to claim 31, wherein the cooking process is cooking using an oven or cooking using a deep-fat fryer.

34. The method according to claim 33, wherein said cooking process results in said first preliminary product disintegrates so that said second preliminary product, which has a stable shape, lies in a bed of said disintegrated first preliminary product.



35. The method of claim 4, wherein said first food item comprises rice and said second food item is a meat filling, a meat product, a sauce/vegetable mixture, or a mixture of vegetables and fruits.

36. The method of claim 35, wherein said second food item is said sauce/vegetable mixture.